

ESTABLISHING A SHORT-RANGE ZIGBEE NETWORK FOR STRUCTURAL HEALTH MONITORING,  
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The SmartBrick 2.0 is an embedded system developed for structural health monitoring at the Missouri University of Science and Technology. A wireless sensor network was developed using the SmartBrick as the base station, facilitating the monitoring of larger-scale structures. The Zigbee protocol, an implementation of IEEE 802.15.4 and the de facto industry standard for low-power communication in wireless sensor networks, was utilized in conjunction with the Texas Instruments CC2480 Zigbee transceiver. Data transmissions between the transceiver and the microcontroller serving as the core of the SmartBrick utilized the Serial Peripheral Interface (SPI) bus and the Universal Asynchronous Receiver Transmitter (UART). Field testing of the system was performed in two locations with the objective of evaluating the throughput and communication range of the network in different environments; the methodology and approach used was validated.